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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/722,597	11/28/2003	Osamu Suzuki	520.43306X00	8275
20457	7590	01/25/2006	EXAMINER	
ANTONELLI, TERRY, STOUT & KRAUS, LLP 1300 NORTH SEVENTEENTH STREET SUITE 1800 ARLINGTON, VA 22209-3873			LEWIS, MONICA	
			ART UNIT	PAPER NUMBER
			2822	

DATE MAILED: 01/25/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/722,597

Applicant(s)

SUZUKI ET AL.

Examiner

Monica Lewis

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 27 October 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) 15-20 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-3 and 6-14 is/are rejected.
- 7) ☒ Claim(s) 4 and 5 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 28 November 2003 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☒ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 11/28/03.
- 4) ☒ Interview Summary (PTO-413)
Paper No(s)/Mail Date. 01/06.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

1. This office action is in response to the election filed October 27, 2005.

Election/Restrictions

2. Applicant's election without traverse of Embodiment I in the reply filed on 10/27/05 is acknowledged. The Examiner notified Gregory E. Montone on 1/12/06 that there was a typographical error in the restriction of 9/29/05 and that Embodiment I should have included claims 1-14 and Embodiment II should have included claims 15-20. Gregory E. Montone stated that the election would be still be without traverse of Embodiment I (claims 1-14).

Specification

3. The abstract of the disclosure is objected to because it exceeds 150 words. Correction is required. See MPEP § 608.01(b).
4. Applicant is reminded of the proper language and format for an abstract of the disclosure.

The abstract should be in narrative form and generally limited to a single paragraph on a separate sheet within the range of 50 to 150 words. It is important that the abstract not exceed 150 words in length since the space provided for the abstract on the computer tape used by the printer is limited. The form and legal phraseology often used in patent claims, such as "means" and "said," should be avoided. The abstract should describe the disclosure sufficiently to assist readers in deciding whether there is a need for consulting the full patent text for details.

The language should be clear and concise and should not repeat information given in the title. It should avoid using phrases which can be implied, such as, "The disclosure concerns," "The disclosure defined by this invention," "The disclosure describes," etc.

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5. The lengthy specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

6. The lengthy specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

Drawings

7. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the following must be shown or the feature(s) canceled from the claim(s): a) other plural number of closed flow passages, being formed along with other side of said semiconductor chip, crossing over the plural number of said closed flow passages formed (See Claim 11). No new matter should be entered.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet"

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pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Objections

8. Claim 1 is objected to because of the following informalities: a) it appears that “the followings” is a typographical error. Appropriate correction is required.

Claim Rejections - 35 USC § 112

9. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

10. Claims 11-13 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Applicant claims “comprising other plural number of closed flow passages, being formed along with other side of said semiconductor chip, crossing over the plural number of said closed flow passages formed” (See Claim 11). It is not clear how the flow passages are going to cross if they are located on opposite sides of the chip. Claims 12 and 13 depend directly or indirectly from a rejected claim and are, therefore, also rejected under 35 U.S.C. 112, second paragraph for the reasons set above.

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Claim Rejections - 35 USC § 103

11. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

12. Claims 1-3, 6-9 and 14 are rejected under 35 U.S.C. 103(a) as obvious over Zuo (U.S. Patent No. 6,631,077) in view of *Microchip Fabrication* by Peter Van Zant.

In regards to claim 1, Zuo discloses the following:

a) a circuit forming layer being formed on one side surface of the plate-like semiconductor chip (160) (For Example: See Figure 1); and

b) a heat transfer layer (110), being connected with the plate-like semiconductor chip in one body, on other side surface opposing to that where said circuit forming layer is formed and comprises inside a closed flow passage (120) and an operating fluid (122) hermetically enclosed within said closed flow passage and driving means (130) of said operating fluid (For Example: See Figure 1 and Column 5 Lines 19-35).

In regards to claim 1, Zuo fails to disclose the following:

a) a plural number of circuits.

However, Van Zant discloses the use of logic and memory elements in a circuit (For Example: See Page 543). It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the semiconductor device of Zuo to include the use of logic and memory elements as disclosed in Van Zant because it is well known that every integrated circuit contains both logic and memory sections (For Example: See Page 543).

Additionally, since Zuo and Van Zant are both from the same field of endeavor (semiconductor), the purpose disclosed by Van Zant would have been recognized in the pertinent art of Zuo.

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In regards to claim 2, Zuo discloses the following:

a) both said plate like semiconductor chip and said heat transfer layer are made of a material of silicon (For Example: See Column 1 Line 14 and Column 4 Lines 43-54).

In regards to claim 3, Zuo discloses the following:

a) driving means of the operating fluids made of means for giving vibration to said operating fluid hermetically enclosed within said closed flow passage (For Example: See Abstract and Column 5 Line 31).

In regards to claim 6, Zuo discloses the following:

a) operating fluid is water (For Example: See Table 1).

In regards to claim 7, Zuo fails to disclose the following:

a) plate-like semiconductor chip is of such a chip wherein logic elements and memory elements are formed separately within the one side surface thereof, on which the circuits are formed.

However, Van Zant discloses the use of logic and memory elements (For Example: See Page 543). It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the semiconductor device of Zuo to include the use of logic and memory elements as disclosed in Van Zant because it is well known that every integrated circuit both logic and memory sections (For Example: See Page 543).

Additionally, since Zuo and Van Zant are both from the same field of endeavor (semiconductor), the purpose disclosed by Van Zant would have been recognized in the pertinent art of Zuo.

In regards to claim 8, Zuo discloses the following:

a) the closed flow passages, being formed in said heat transfer layer, are formed in a plural number thereof, along with one side of said semiconductor chip (For Example: See Figure 1).

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In regards to claim 9, Zuo discloses the following:

a) the closed flow passages formed in the plural number thereof has the means for driving the operating fluid enclosed within an inside thereof, independently (For Example: See Abstract).

In regards to claim 14, Zuo discloses the following:

a) a plate-like semiconductor chip (For Example: See Figure 1);

b) a circuit forming layer being formed on one side surface of the plate-like semiconductor chip (For Example: See Figure 1); and

c) a heat transfer layer, being formed on other side surface opposing to the side surface on which said circuit forming layer is formed, for suppressing a local increase in temperature caused due to heat generation of the circuit within said circuit forming layer of said semiconductor chip, being connected therewith in one body (For Example: See Figure 1 and Column 2 Lines 13-25).

In regards to claim 14, Zuo fails to disclose the following:

a) a plural number of circuits.

However, Van Zant discloses the use of logic and memory elements in a circuit (For Example: See Page 543). It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the semiconductor device of Zuo to include the use of logic and memory elements as disclosed in Van Zant because it is well known that every integrated circuit contains both logic and memory sections (For Example: See Page 543).

Additionally, since Zuo and Van Zant are both from the same field of endeavor (semiconductor), the purpose disclosed by Van Zant would have been recognized in the pertinent art of Zuo.

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13. Claim 10 is rejected under 35 U.S.C. 103(a) as obvious over Zuo (U.S. Patent No. 6,631,077) in view of *Microchip Fabrication* by Peter Van Zant and O'Connor et al. (U.S. Publication No. 2002/0039280).

In regards to claim 10, Zuo fails to disclose the following:

a) a plural number of temperature detecting means are provided within said semiconductor chip, wherein said plural number of driving means provided independently are controlled depending upon temperature detection outputs from said temperature detecting means.

However, O'Connor et al. ("O'Connor") discloses the use of a plural number of temperature detecting means are provided within said semiconductor chip, wherein said plural number of driving means provided independently are controlled depending upon temperature detection outputs from said temperature detecting means (For Example: See Page 8-Claim 6). It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the semiconductor device of Zuo to include the use of a plural number of temperature detecting means are provided within said semiconductor chip, wherein said plural number of driving means provided independently are controlled depending upon temperature detection outputs from said temperature detecting means as disclosed in O'Connor because it aids in providing a means to allow the device to be cooled (For Example: See Abstract).

Additionally, since Zuo and O'Connor are both from the same field of endeavor (semiconductor), the purpose disclosed by O'Connor would have been recognized in the pertinent art of Zuo.

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Allowable Subject Matter

14. Claims 4 and 5 objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

15. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Monica Lewis whose telephone number is 571-272-1838. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Zandra Smith can be reached on 571-272-2429. The fax phone number for the organization where this application or proceeding is assigned is 571-272-8300 for regular and after final communications. Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0956.

ML

January 23, 2006

A handwritten signature in black ink, appearing to be 'ML' or similar, located in the bottom right corner of the page.